Pre-conference Workshops

Paper

Introduction to Access Management:

A comprehensive overview of the practice

Instructors: Vergil Stover, University of South Florida
Bud Koepke, S/K Transportation Consultants, Inc.
Rindy Lasus, New Jersey Department of Law & Public Safety

Other

Mobile Workshop

Implementation of Access Management with Pedestrian/Bicycle Issues

Instructors: Xavier Falconi, Entranco, Inc.
Michael Ronkin, Oregon DOT
Gerry Juster, Oregon DOT
Del Huntington, Oregon DOT

Other

WELCOME RECEPTION

AN INTRODUCTION TO ACCESS MANAGEMENT

Vergil G. Stover
1008 Woodcreek Drive
College Station, Texas 77845
e-mail: vstover@tca.net

and

Frank J. Koepke
4326 New Hope Spring Drive
Hillsborough, North Carolina 27278

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1.0 OVERVIEW

1.1 What is Access Management?

Access management is the process of balancing the competing needs of traffic movement and land access.

Access management provides access to land development while simultaneously preserving the safe and efficient flow of traffic on the roadway system. It applies traffic engineering principles to the location, design and operation of access drives serving activities along the highway. It evaluates the suitability of providing access to a given road, as well as the suitability of a site for land development. It addresses the basic questions – when and where access should be located, how it should be designed, and the procedures needed to administer the program. In broad context, it is resource management, since it is a way to anticipate and prevent safety problems and congestion.

Access management includes: 1. Classifying roadways based upon functional criteria which reflect the importance of each roadway to statewide, regional and local mobility; 2. Defining allowable levels of access for each road class, including criteria for the spacing of signalized and unsignalized access points; 3. Applying appropriate geometric design criteria and traffic engineering analysis to the allowable access; and 4. Adopting appropriate regulations and administrative procedures. The highest levels of access location and design are applied to freeways and arterials. The least access control is applied to local roads – including minor collectors and local access roads.

1.2 Why Manage Access?

Streets and highways are an important resource and represent a major public investment that should be preserved.

Solomon (1) recognized the need for access management as indicated by the following:

"When conventional highways are constructed on new rights-of-way, initially there are few commercial driveways and the safety record is good. As the highways get older, the traffic volume builds up, roadside businesses develop, more and more commercial driveways are cut, and the accident rate gradually increases."

Solomon concludes:

"This demonstrates the importance of maintaining control of access when either two-lane or multi-lane highways are built on new locations. Increased numbers of either intersections or driveways will increase the accident rate. Intersections should be restricted to those essential for the highway, and the right (direct) access from abutting businesses should be severely limited."

McGuirk (2) established the fact that accidents at access drives increase as both through-lane traffic volumes and driveway volumes increase. The problem has also been recognized in the following quote from the State Highway Access Code of Colorado (3):

> "The lack of adequate access management on the highway system and the proliferation of driveways and other access approaches is a major contributor to highway accidents and the greatest single factor behind the functional deterioration of highways in the state. As new access approaches are constructed and traffic signals erected, the speeds and capacity of the highway decrease, and congestion hazards to the traveling motorist increase."

What are the Symptoms of Poor Access Management?

- High crash rates
- Poor traffic flow and congestion
- Numerous brake light activations by drivers in the through lanes
- Unsightly strip development
- Neighborhoods disrupted by through traffic
- Using a local street parallel to the overburdened "arterial" to make a one-way pair
- Pressures to widen an existing street or build a bypass
- Bypass routes as congested as the roadways they were built to relieve
- A decrease in property values

1.3 What if We Don't Manage Access?

New and improved major roadways lead to convenient movement and increased traffic volumes. The increased activity is accompanied by an increase in the number of driveways. This results in an increase in the number and severity of conflicts, an increase in traffic crashes and a decline in the quality of traffic service. This, in turn, generates the demand for additional improvements or the need for a bypass.

Safety hazards and congestion on major roadways translate into significant social and economic costs. The Colorado DOT reported that access-related crashes on Colorado state highways cost society approximately $900 million per year (4). In Oregon, access related crashes on state highways, excluding interstate highways, cost at least $816-million per year, $380-million of this is attributable to only 632 miles of state highways in urban areas (5).

Washington DOT Finds A Close Relationship Between the Number of Access Points and the Number of Crashes

State Route 99, Pacific Highway, is a 4-lane roadway with a TWLTL and shoulders. Figure 1 prepared by the Washington State DOT shows a close relationship between the number of access points (access drives plus cross-streets) and the number of crashes.

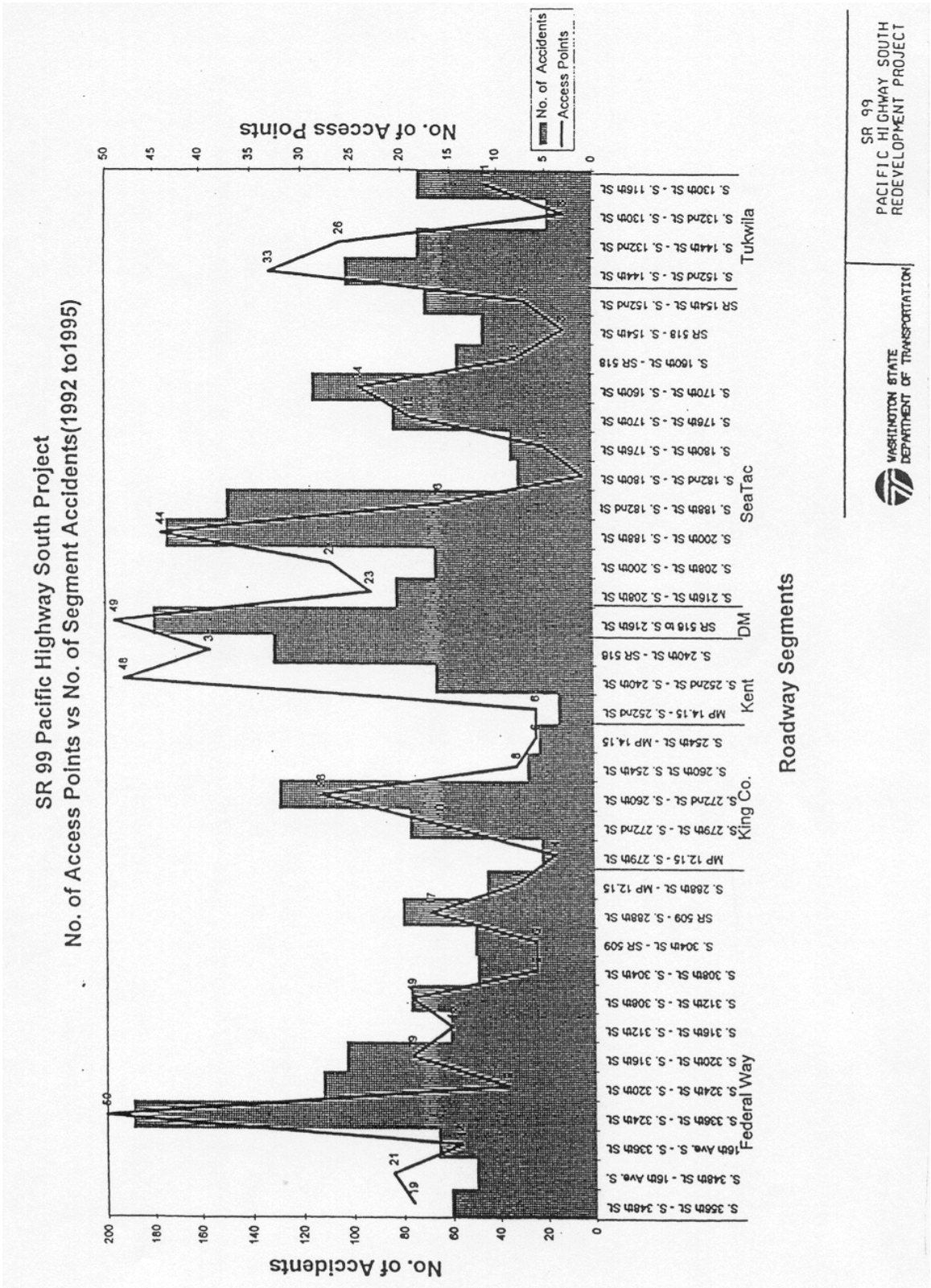

SR 99 Pacific Highway South Project
No. of Access Points vs No. of Segment Accidents(1992 to1995)
No. of Accidents
No. of Access Points
No. of Accidents
Access Points
Roadway Segments
Federal Way
King Co.
Kent
DM
SeaTac
Tukwila
S. 356th St. - S. 348th St.
S. 348th St. - 16th Ave. S.
16th Ave. S. - S. 336th St.
S. 336th St. - S. 324th St.
S. 324th St. - S. 320th St.
S. 320th St. - S. 316th St.
S. 316th St. - S. 312th St.
S. 312th St. - S. 308th St.
S. 308th St. - S. 304th St.
S. 304th St. - SR 509
SR 509 - S. 288th St.
S. 288th St. - MP 12.15
MP 12.15 - S. 279th St.
S. 279th St. - S. 272nd St.
S. 272nd St. - S. 260th St.
S. 260th St. S. 254th St.
S. 254th St. - MP 14.15
MP 14.15 - S. 252nd St.
S. 252nd St. - S. 240th St.
S. 240th St. - SR 518
SR 518 to S. 216th St.
S. 216th St. - S. 208th St.
S. 208th St. - S. 200th St.
S. 200th St. - S. 188th St.
S. 188th St. - S. 182nd St.
S. 182nd St. - S. 180th St.
S. 180th St. - S. 176th St.
S. 176th St. - S. 170th St.
S. 170th St. - S. 160th St.
S. 160th St. - SR 518
SR 518 - S. 154th St.
SR 154th St. - S. 152nd St.
S. 152nd St. - S. 144th St.
S. 144th St. - S. 132nd St.
S. 132nd St. - S. 130th St.
S. 130th St. - S. 116th St.
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
SR 99
PACIFIC HIGHWAY SOUTH
REDEVELOPMENT PROJECT

Figure 1

1.4 Who Benefits from Access Management?

Motorists

- Fewer crashes
- Reduce travel time
- Reduce travel delay
- Lower fuel consumption

Pedestrians and Bicyclists

- Fewer driveways mean fewer conflicts with vehicles
- Pedestrian refuge in median
- Fewer pedestrian and cyclist deaths and injuries

Bus Riders

- Reduce travel time
- Improved schedule reliability

Property Owners

- Preserves private investment
- Limits through traffic in residential areas

General Public

- Helps stabilize land use patterns
- Encourages coordination of land use and transportation decisions
- Preserves the public investment in major thoroughfares
- Fewer deaths and injuries resulting from vehicular crashes and vehicular – pedestrian/cyclist crashes
- Reduced loss in property damage
- Reduce vehicular emissions
- Supports and helps maintain livable communities

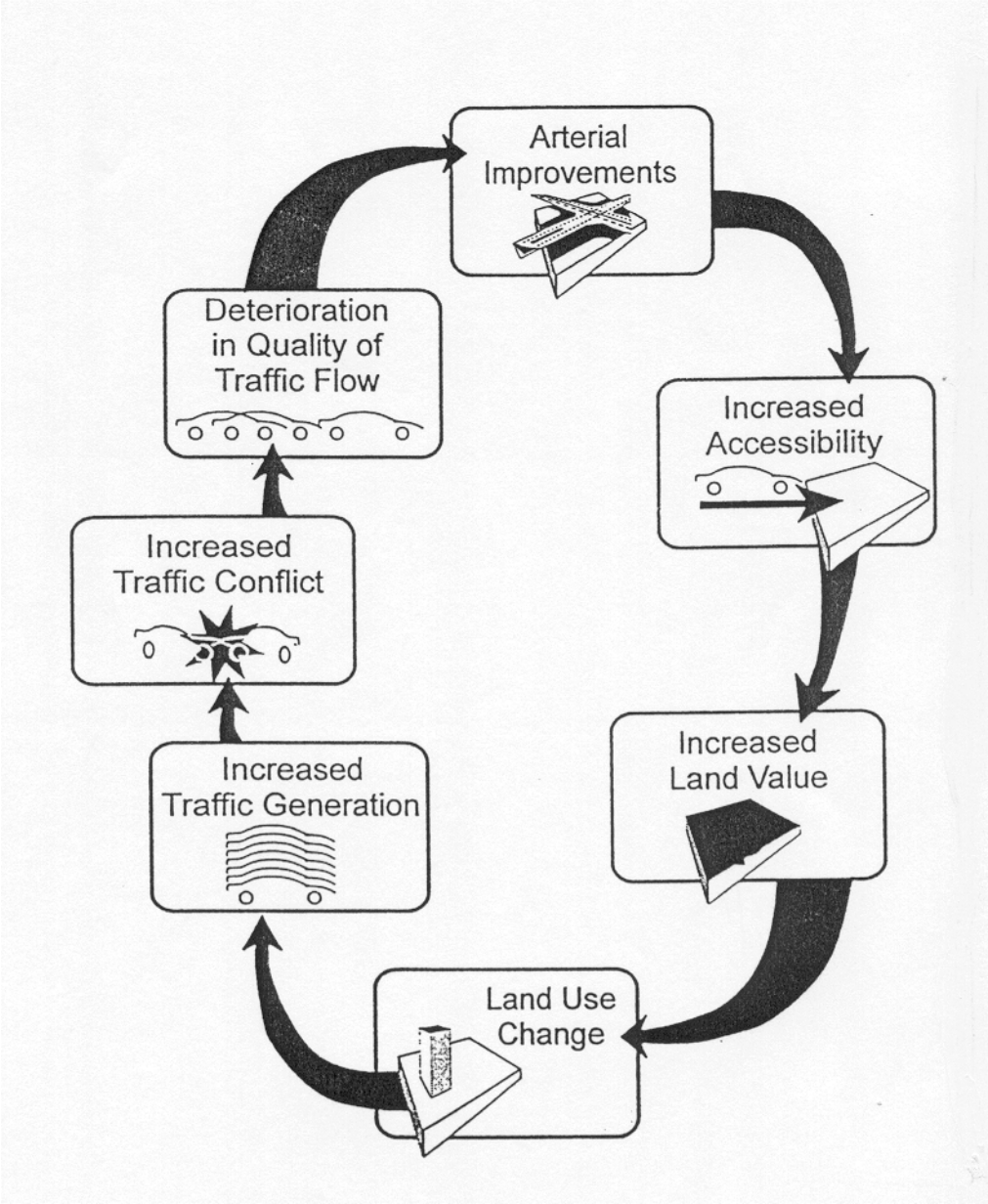
1.5 The Transportation-Land Use Cycle

The Failure To Manage Transportation And Land Use Results in a Continuing Cycle of Obsolescence

Major improvements in the roadway system change the relative advantages of various locations. This in turn, results in a change in the pattern of land values and land uses. In the absence of good land use planning and access management, traffic safety and the quality of traffic movement deteriorates. The need to decrease vehicular crashes and restore capacity requires improvements to the roadway system.

Reconstruction to increase the level of service of an existing arterial is generally very costly and disruptive to both the public and the abutting businesses. Furthermore, improvement in the level of service is often temporary because the improved service stimulates increased business activity. Furthermore, the shallow property depth, multiplicity of ownership, and right-of-way limitations generally preclude good redesign of access and site circulation, even when substantial expenditures are made for reconstruction of existing streets. In order to better accommodate traffic demand, roadway improvements are required and a cyclical sequence of events occurs which requires continuing capital investments for arterial improvements or relocation. In the more severe cases, the arterial must be relocated due to functional obsolescence and the process starts all over again on a new location. The cycle is illustrated in Figure 2.

Poorly coordinated on-site circulation systems and the failure to develop a supporting roadway system force more trips onto the arterial roadways. This results in multiple traffic conflicts, increased congestion and a decline in traffic and pedestrian safety. This generates a demand for roadway improvements and the cycle begins again. Failure to address the congestion and safety problems ultimately leads to a deterioration in the abutting properties. These are not the inevitable of development and urban growth. Rather, they are symptoms of inadequate attention to access management to preserve the integrity of the roadway system as development occurs. However, local governments have extensive powers which can be applied to manage land uses as well as roadway improvements. State highway agencies are limited to dealing with managing the highway system per se. In any event, close coordination between the state DOT and local government is essential to effective management of the transportation-land use cycle.



The Transportation-Land Use Cycle

Source: Reference (6)

Figure 2

1.6 References

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2. William K. McGuirk, "Evaluation of Factors Influencing Driveway Accidents," Report of the Joint Highway Research Project, Purdue University, May 1973.

3. "The State Highway Access Code," Department of Highways, State of Colorado, August 15, 1985.

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5. Vergil G. Stover, Presentations to the Association of Oregon Counties and the League of Oregon Cities, November 1996.

6. Vergil G. Stover and Frank J. Koepke, Transportation and Land Development, Institute of Transportation Engineers, Prentice-Hall, Inc. 1988.